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New Study Looks For Evidence Of Network-Centric Logistics In Iraq

A recently completed study for the Office of Force Transformation examines military logistics during Operation Iraqi Freedom and delves into lessons from the conflict to determine if a "sense and respond logistics capability" (SRLC) is beginning to take root in the armed services.

Based on interviews with U.S. Central Command planners and warfighters, the report, prepared by Science Applications International Corp., compares logistics during the 1991 Desert Storm operation to Iraqi Freedom. The study examined what worked in this year's conflict and uncovered problems that SRLC might have solved.

"Comparison with Desert Storm and other previous conflicts indicates rapid development of the information technology base called for by SRLC," the document states. However, "the impact of this is hidden by logistics doctrine that is not keeping up with the technology."

A lag in developing logistics that can fully support "the shift of U.S. combat forces to greater network-centric capabilities and operations could turn out to be the Achilles heel" of future conflicts, particularly if the United States comes up against a more formidable enemy than Saddam Hussein's Iraq, the report says.

SAIC says one of the biggest stories of Operation Iraqi Freedom was the inability of logistics to keep up with rapidly advancing combat forces, which at times meant shortages of food and fuel for front-line troops.

At the same time, a large amount of materiel was shipped to the Middle East for the operation, the report notes. "History suggests that the U.S. per capita logistics demand, expressed in the weight of the support and its transportation, for an operation like Iraqi Freedom is three times what it was in World War II and nearly 15 times what it was in World War I," the study says.

Transforming logistics

OFT and other defense officials are exploring the sense and respond concept as a means of transforming the way the military conducts future operations. The transformation office is working on a concept of operations for SRLC.

Interest in SRLC developed as those officials began to consider what kind of logistics system is needed to support network-centric warfare.

Most military planners expect future U.S. operations to feature "widely dispersed, semi-independent joint forces," networked together, conducting concurrent rather than sequential actions, the SAIC report states. A number of them say the kind of speed and flexibility exhibited by U.S. forces in Operation Iraqi Freedom is a taste of what the joint force will be capable of doing in the

near future, completing a dramatic shift away from attrition-based warfighting embraced by the bulk of the armed services for generations.

Network-centric warfare depends in large part on technical and organizational developments that give U.S. forces enhanced battlespace awareness, secure global communications and the ability to conduct effects-based operations with precision weaponry. Taken together, these capabilities could allow U.S. force to "operate effectively within the decision-reaction cycles of their opponents," the report states.

SRLC will be an "integral component" of network-centric warfare, the document states. Just as network-centric warfare promises to make U.S. forces better able to handle rapidly changing circumstances on the battlefield, sense and respond is intended to make the underlying logistics system more responsive to such conditions.

The concept is expected to be more adaptive and sensitive to warfighters' needs, delivering "what is needed to all the units in a force, when and where they need it," the SAIC study states.

SRLC could mean new mechanisms for the rapid procurement, reordering and delivery of supplies, which could include sensor monitors that would send "anticipatory, early warning signals based on real time/operational events and stimulate activity leading to decisions in the value chain," OFT says in its own Aug. 4 report.

While Industrial Age logistics recognizes the limitations of preplanning for the needs of warfighters, and attempts to introduce flexibility in the system to deal with the problem, SRLC goes a step further by emphasizing "adaptive" capabilities, according to SAIC's report.

The word adaptive "connotes a greater capacity to adjust to a broader range of environmental factors, including timing and radical changes in context. In other words, linearity and sequenced actions are much less characteristic of SRLC," the study states. "It is more serendipitous and synergistic; less routed in preplanning, more on planning on the fly," using the information and communications systems that enable network-centric warfare and a "command-and-control system that pushes authority downward."

Another benefit is SRLC could make it easier to integrate logistics within overall military operations. Sense and respond also is expected to facilitate the delivery of supplies from any unit of any service to those who need them most.

Further, defense officials see SRLC as a way of helping the military carry out its missions from strategic and operational distances. That means U.S. forces would not have to rely so much on building up forward operating locations close to potential hotspots -- which may be harder to do in the future.

The United States is likely to face a host of anti-access challenges in future operations. For instance, countries may deny U.S. forces use of their territory for war, as Turkey did in Operation Iraqi Freedom. In addition, large overseas bases that are built up in stages may become easier

targets for adversaries armed with new technology, or well versed in asymmetric tactics, defense officials say.

During Operation Iraqi Freedom, U.S. forces displayed a remarkable ability to adapt to changing situations, which bodes well for those who want to revamp the military's logistics system along the lines of sense and respond, officials say.

"In logistics, many of the adaptations coincided with key elements of an SLRC. This suggests that at least those elements have potential traction with the warfighters," the SAIC report states. "This is important for the extent of and pace at which the SLRC emerges as the logistics component of network-centric warfare. It will come, we think, much faster and deeper than most anticipate."

Signs of the future?

In the months before the Iraq war kicked off March 19, military planners envisioned a rapid march on Baghdad. These officials understood well the possible routes to take to the capital and the specific challenges U.S. forces could expect to find with each one, the SAIC report states.

U.S. forces would have to maneuver not only through desert but also populated and lush areas in the Euphrates River valley, which placed a premium on securing key bridges as the war unfolded.

"The logistics train supplying critical fuel, ammunition and food to front-line forces would stretch hundreds of miles," the planners realized. "At one point, Army [officials] even looked at moving supplies by barge up the Euphrates to speed the supply chain, and a special Army railroad unit studied the feasibility of quickly repairing Iraq's north-south railroad line."

The SAIC report compares logistics differences in operations Desert Storm and Iraqi Freedom, some of which can be explained by the reduced effectiveness of Iraqi forces in 2003 and a changed strategy for the later conflict.

In Desert Storm, high-tech container identification was nonexistent, while logisticians in Iraqi Freedom made use of radio frequency identification tags, and related hardware and software. Duplicate orders were placed during Desert Storm because "operational units had inadequate visibility over the status of their requisitions." In 2003, military officials explored "total asset visibility" and developed Joint TAV to avoid redundant requisitions in future operations.

In Iraqi Freedom, a number of logistics practices could be viewed as harbingers of a sense and respond capability, according to SAIC.

For example, there were instances of supply from any unit, any service. While the instances in which this occurred by design were rare, "it did appear to be close to a systemic reaction in three cases," the report states. "One of these was in a cross-service support to bare basing, in which Air Force requirements were fulfilled by nearby Army units in a self-synchronous manner."

There also were examples during the war of "supply push" to meet real-time demand signals and the extensive use of "cross-service, electronic order, asset and inventory visibility [and] decision support tools."

Supply push often involved moving materiel forward to the troops without waiting for specific requests. The important issue here for SAIC was how the planners decided whom should get the supplies.

"There was little, if any, of the more advanced technology available that the SRLC encompasses (as far as we can determine, automatic demand signals indicating a unit's real-time and projected readiness, for example, were not present in the theater)," the report states. "But the logisticians making the decisions on what and where to push materiel forward were able to tap into much the same battlespace awareness that existed for combat units, and they were apprised of the schemes of maneuver of most of the units they sought to support."

Operation Iraqi Freedom also featured some aspects of network-centric warfare and logistics in support of that approach to fighting.

Executing the warfighting strategy was "far more adaptive than virtually any operation conducted previously, with the possible exception of Operation Enduring Freedom," the report states. With ground forces moving rapidly, Iraqi Freedom featured forces "operating in a more dispersed manner than had been anticipated, and logistics support adapted to this condition. Both combat and support forces were -- at least in some cases -- reconfigured on the fly."

An issue for transformation advocates to ponder is whether these features occurred "more in this war than in others and whether their occurrence was seen as different enough to point to the emergence of a change in kind and a new operational concept," the report says. "Did their occurrence constitute something so extraordinary as to be seen as justifying a shift to an SRLC?"

Fixing problems

The SAIC report includes a section on how logistics problems experienced in Operation Iraqi Freedom could have been solved using sense and respond capabilities.

During the conflict, U.S. forces, racing forward, exceeded planning expectations and often outran the communications system for logistics support, the report states.

"The fast pace of operations led many combat units to try to expedite the processing and delivery of their supply needs by sending requisitions through whatever means was immediately available, often imbedding them in e-mail traffic or situational reports instead of logistics information systems," the document states. There also was a lack of reliable communications for combat service support forces.

"An SRLC would alleviate these problems in two ways. On one hand, the capability presumes a more robust communications/information infrastructure than what existed in Operation Iraqi

Freedom," SAIC says. Second, SRLC would replace a linear supply chain with a networked one that should ease communications difficulties.

Sense and respond could improve on advances made in recent years in maintaining in-transit visibility of supplies. SAIC researchers found that logisticians in Iraq were able to "locate and track in real time more than two-thirds of all the materiel destined for the conflict in Iraq." However, the remaining "invisibility" caused problems.

SRLC advocates also expect the capability could weed out irrelevant performance metrics that logisticians use and better deal with tactical surpluses and shortages of supplies that can plague military operations.

As they refine a concept of operations for sense and respond, OFT is exploring what the capability would mean in terms of new processes, technology and organizations throughout the Defense Department. The work will be tested in a number of upcoming experiments.

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